

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

REC'D 14 DEC 2005

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(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P24486PC	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/NO2004/000359	International filing date (day/month/year) 24.11.2004	Priority date (day/month/year) 27.11.2003
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant AGR SUBSEA AS et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 08.08.2005	Date of completion of this report 24.11.2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Christer Bäcknert/MP Telephone No. +46 8 782 25 00

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

E21B 21/08 (2006.01)

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____,
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 6 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 1 - 2 _____ received by this Authority on 08.08.2005
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 2 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-5</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-5</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-5</u>	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US4291772 A
D2: GB2273948 A
D3: WO03023181 A1

Document D1, which is considered to represent the most relevant state of the art, discloses method and apparatus to reduce the tension required on a riser pipe used in offshore drilling. Drilling fluid is circulated down a drill pipe through a drill bit and returned up the annulus between a drill string and the borehole wall. The prior art invention further provides a riser pipe from the wellhead, the riser being filled with a lightweight fluid on top of the drilling fluid in said annulus.

The subject-matter of claims 1 and 4 differs from this prior art in that it is intended to keep the downhole pressure substantially constant by keeping the level of the interface between the drilling fluid and the riser fluid is regulated by adjusting the inlet pressure of the pump.

The subject-matter of the claims therefore is novel.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed method and device for controlling drilling fluid pressure. Therefore, the

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1- 5 is novel and is considered to involve an inventive step.

The invention is industrially applicable.

08-08-2005

A m e n d e d C l a i m s

1. A method of controlling drilling fluid pressure during drilling offshore, where drilling fluid is pumped down into a borehole (15) and then flows back to a drilling rig (1) via the lined and/or unlined sections of the borehole (15) and a liner (14), and where the drilling fluid pressure is controlled by utilizing a pump (20) to pump drilling fluid out of the liner (14) near the seabed, and where the annulus (30) of the liner (14) above the drilling fluid is filled with a riser fluid having a density which is lower than that of the drilling fluid, c h a r a c t e r i z e d i n that level of the interface between the drilling fluid and the riser fluid is regulated by adjusting the inlet pressure of the pump (20).
2. A method in accordance with Claim 1, c h a r a c t e r i z e d i n that the volume of riser fluid flowing into and out of the annulus (30) is monitored.
3. A method in accordance with Claim 2, c h a r a c t e r i z e d i n that the volume of drilling fluid and riser fluid flowing into and out of the annulus (30) is compared with the drilling fluid volume being introduced into the borehole (15) via a drill string (16).
4. A device for controlling drilling fluid pressure during drilling offshore, where drilling fluid is pumped down into a borehole (15) and then flows back to a drilling rig (1) via the lined and/or unlined sections of the borehole (15) and a liner (14), and where the drilling fluid pressure is controlled by utilizing a pump (20) to

pump drilling fluid out of the liner (14) near the seabed, and where the annulus (30) of the liner (14) above the drilling fluid is filled with a riser fluid having a density which is lower than that of the drilling fluid, c h a r a c t e r i z e d i n
5 that the inlet pressure of the pump (20) is adjustable.

5. A device in accordance with Claim 4,
c h a r a c t e r i z e d i n that the annulus
(30) communicates with a tank (26) on the drilling rig
10 (1) by means of a connecting pipe (28), the connecting pipe (28) being fitted with volume measuring equipment.